



February 14, 2002

**REQUEST FOR REVIEW OF THE ENERGY COMMISSION STAFF'S POWER PLANT ENCLOSURE ANALYSIS REPORT (SUPPLEMENT TO VISUAL RESOURCES, FINAL STAFF ASSESSMENT PART I) FOR THE MORRO BAY POWER PLANT (MBPP) PROJECT (00-AFC-12)**

The enclosed report, submitted by the Energy Commission staff, is supplemental testimony to the Visual Resources section of the Final Staff Assessment (FSA) Part I which was filed on November 15, 2002. Duke Energy North America, the Applicant, proposed in their Application for Certification (AFC) a partially enclosed facility. On December 4, 2001, the Project Committee requested that the Applicant submit an analysis of a full enclosure option for MBPP and also requested that the Energy Commission staff provide an evaluation of this analysis. On January 2, 2002, the Applicant submitted an analysis titled Morro Bay Modernization Project Visual Analysis of Full Enclosure. The enclosed report is the staff's evaluation of that analysis and its current position on facility enclosure options for the MBPP.

We request that you review the enclosed report and provide any written comments to Marc Pryor, the Energy Commission's Project Manager, by March 5, 2002.

**Purpose of Analysis**

The Applicant's design for a partially enclosed facility had the following objective: to enclose all four of the gas turbines and both of the steam turbines in structures which minimized their height and bulk. Other features of the partially enclosed design are low and removable roofs and low-profile pipe racks.

In the Visual Resources section of the Energy Commission staff's Preliminary Staff Assessment (filed May 25, 2001), it was noted that the proposed project would still have "...a much stronger industrial character as a result of a more visible structural complexity..." (page 4.11-24). This was primarily a result of the visibility of the numerous pipes and equipment along the sides and above the heat steam recovery generators (HRSG) structures. This complex industrial character is the primary issue of concern when the proposed plant is viewed from Morro Strand State Beach and Morro Dunes Trailer Park and Resort Campground.

The staff has received comments regarding the proposed plant's industrial character and the need for an analysis of a full enclosure option to screen this industrial character from sensitive views. *This present analysis evaluates two enclosure approaches.* The first approach is referred to as Partial Enclosure/Structural Shielding. The intent of this staff-developed concept is to provide additional covering/shielding of the most industrial appearing project elements without the structural prominence of a building sized to contain all four HRSGs. The second approach evaluated here is that of a full enclosure

December 21, 2001

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as developed and presented by the Applicant in their recent submittal titled Morro Bay Modernization Project Visual Analysis of Full Enclosure filed on January 2, 2002.

### **Summary of Conclusions**

Staff concludes that from all viewing areas, the full enclosure option is more likely to cause significant visual impacts and thus, is least preferred compared to either the currently proposed project or staff's structural shield concept. Similar to the proposed project and the structural shield concept, the full enclosure option is more likely to cause visual impacts than the existing power plant when viewed from close proximity viewpoints. From more distant viewpoints, however, the full enclosure option would be less likely to cause significant visual impacts than the existing power plant.

### **Further Information**

If you want information on how to participate in the Energy Commission's review of the project, please contact Ms. Roberta Mendonca, the Energy Commission's Public Adviser, at (916) 654-4489 (toll free in California at (800) 822-6228), or by email at [pao@energy.state.ca.us](mailto:pao@energy.state.ca.us). Technical or project schedule questions should be directed to Marc Pryor, Project Manager, in the Systems Assessment and Facility Siting Division, at (916) 653-0159, or by email at [mpryor@energy.state.ca.us](mailto:mpryor@energy.state.ca.us). A copy of the report, the status of the project, copies of notices and other relevant documents are also available on the Energy Commission's Internet web page at **[www.energy.ca.gov/sitingcases/morrobay](http://www.energy.ca.gov/sitingcases/morrobay)**. News media inquiries should be directed to Assistant Executive Director, Claudia Chandler, at (916) 654-4989.

Sincerely,

PAUL RICHINS, JR.  
Energy Facilities Licensing Manager

Enclosure

# MORRO BAY POWER PLANT PROJECT POWER PLANT ENCLOSURE ANALYSIS VISUAL RESOURCES

Testimony of Michael Clayton

## INTRODUCTION

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During the course of project development, the Applicant (Duke Energy North America) conducted a series of public meetings to obtain input regarding project design. The Applicant subsequently proposed in their Application for Certification (AFC) a partially enclosed facility. On December 4, 2001, the Project Committee requested that the Applicant submit an analysis of a full enclosure option for MBPP and also requested that the Energy Commission staff provide an evaluation of this analysis. On January 2, 2002, the Applicant submitted an analysis titled Morro Bay Modernization Project Visual Analysis of Full Enclosure (Duke 2002).

In this filing, the project's current enclosure approach is described as follows:

"The Project, as described in the AFC, encloses all four of the gas turbines and both of the steam turbines in structures designed to minimize their height and bulk. Roofs are kept low by eliminating internal cranes required for equipment maintenance and removal. The roofs are also designed to be removable so that, when required, large portable cranes can be set up outside the enclosures for maintenance. The low-profile pipe rack is one of the design features of the applicant's proposal that also minimizes industrial height and bulk. The only remaining equipment to be considered for enclosure are the heat recovery steam generators (HRSGs) and the central pipe rack" (Duke 2002).

In the Visual Resources section of the Preliminary Staff Assessment (PSA), it was noted that the proposed project would still have "...a much stronger industrial character as a result of a more visible structural complexity..." (page 4.11-24). This was primarily a result of the visibility of the numerous pipes and equipment along the sides and above the HRSG structures. This complex industrial character was the primary issue of concern when viewed from KOP 5 (Morro Strand State Beach) and KOP 6 (Morro Dunes Trailer Park and Resort Campground).

Comments have been received regarding the proposed project's industrial character and the need for an analysis of a full enclosure option to screen this industrial character from sensitive views. The Visual Resources section of the Final Staff Assessment (FSA) Part I concluded that if timely and effective vegetative screening of the sound wall and most lower structural forms could be achieved, the otherwise resulting significant visual impact would be mitigated to a level that would not be significant. Staff agrees that additional effort to minimize visibility of the complex piping is appropriate and could further reduce the visual impact of the proposed project particularly when viewed from areas in close proximity to the project site (such as KOPs 5 and 6). However, solutions that substantially increase structural height and bulk would also likely increase visual contrast, project dominance, and view blockage which would be counter productive.

Therefore, this present analysis will evaluate two enclosure approaches. The first approach is referred to as Partial Enclosure/Structural Shielding. The intent of this staff-developed concept is to provide additional covering/shielding of the most industrial appearing project elements without the structural prominence of a building sized to contain all four HRSGs. The second approach evaluated here is that of a full enclosure as developed and presented by the Applicant in their recent submittal (Duke 2002).

### ***PARTIAL ENCLOSURE/STRUCTURAL SHIELDING***

Staff has attempted to develop an enclosure concept that would cover or shield the majority of the complex piping and equipment that contribute so substantially to the proposed project's industrial character. At the same time, staff also believes that it is important to minimize overall structural height and bulk. Thus, staff has suggested the use of removable "structural shields" that would either be placed around the lower portions of the HRSG structures or be attached directly to the structures. It is important that the shields either be positioned appropriately or be removable to allow access to the piping and equipment for maintenance as necessary. As envisioned by staff, the shields would not have roofs and would allow for the set up of large portable cranes outside of the shields for maintenance.

Four images (see Figures 1 through 4 in Appendix A) have been prepared to facilitate an understanding of staff's Structural Shielding Concept and its benefits. **FIGURE 1** shows the project as presently proposed when viewed from KOP 5 on Morro Strand State Beach. Clearly, the project's HRSG structures and attached piping present a highly complex and industrial structure, which substantially contrasts with the coastal landscape. **FIGURE 2** presents a simulation of staff's concept of partial enclosure or structural shielding. As shown in the simulation, the shields would be fitted to or placed around each individual HRSG structure. The result is a substantial reduction in visible piping and structural complexity with only a slight increase in apparent structural mass and prominence. Visual contrast is reduced while view blockage is slightly increased though not noticeably so. Project dominance would be similar to the project as proposed. The illustrated shields would not have roofs, and sight lines through the facility would be similar to those through the project as presently proposed. Overall, staff views such a change as a net visual improvement over the proposed project when viewed from KOP 5. However, it is important to note that this simulation represents a preliminary concept that has not been tested for feasibility or increased effects if any of building downwash caused by the shields. Furthermore, there would need to be the obvious accommodations for piping that connects between structures, but the objective of further reducing the prominence of complex piping is well illustrated.

**FIGURE 3** shows the proposed project viewed from KOP 6 in the Morro Dunes Trailer Park and Resort Campground. Again, the piping creates a highly complex and industrial-appearing facility that causes a high degree of visual contrast. **FIGURE 4** presents staff's partial enclosure/structural shielding concept. Similar to the result for KOP 5, the project's complex industrial character is substantially reduced by the HRSG shields with a substantial reduction in visual contrast. Project dominance and view blockage are similar to that of the project as presently proposed. The reduction in industrial character and visual contrast would result in a net visual improvement over the project as proposed.

## ***FULL ENCLOSURE***

The following conclusions are based on the “wire frame” images provided by the Applicant in their recently submitted full enclosure report (Duke 2002).

In contrast to staff’s concept of individual HRSG shields as discussed in the previous section, the Applicant’s enclosure analysis and simulations assume one large building, with all equipment (including HRSG structures) enclosed. The enclosure structure would include all six turbines, four HRSGs and the four stacks up to the 130-foot level. The enclosure structure is estimated to be 620’ deep x 550’ wide x 130’ high. The building height would be required to contain the overhead bridge cranes used to access equipment on top of the HRSGS (Duke 2002, p. 5). Based on this structural configuration, the Applicant further estimates that the four HRSG stacks would need to be raised an additional 45’ in height from 145’ to 190’ as a result of building downwash effects.

### **KOP 5 – MORRO STRAND STATE BEACH**

As viewed from KOP 5 (see Duke 2002), the enclosure would screen from public view the complex industrial appearance of the project but would significantly increase the project’s dominance and view blockage compared to either the existing power plant or project as presently proposed. The structure’s massive geometric form and prominent horizontal and vertical lines would contrast highly with the natural forms and lines of the shoreline landscape. The enclosure would appear co-dominant in the landscape and substantially interrupt sightlines to the coastal hills to the east and southeast of the project. The resulting visual impact would be adverse and significant. Due to the size of the enclosure, it is not clear that vegetative screening would be sufficiently effective in screening the structure from view such that the visual impact would be reduced to a level that would not be significant. Therefore, this option is least preferred compared to the currently proposed project or staff’s structural shield concept (if proven feasible).

### **KOP 6 – MORRO DUNES TRAILER PARK AND RESORT CAMPGROUND**

Viewed from KOP 6 (see Duke 2002), the enclosure would screen from public view the complex industrial appearance of the project but would significantly increase the project’s dominance and view blockage compared to either the existing power plant or project as presently proposed. The structure would cause a high degree of visual contrast due to its massive geometric form and prominent horizontal and vertical lines. The enclosure would dominate the landscape and substantially block views to the southeast. The resulting visual impact would be adverse and significant. Due to the size of the enclosure and its relatively close proximity to the viewer, it is not clear that vegetative screening would be sufficiently effective in screening the structure from view such that the visual impact would be reduced to a level that would not be significant. Therefore, this option is least preferred compared to the currently proposed project or staff’s structural shield concept.

### **KOP 7 – EMBARCADERO ROAD**

As viewed from KOP 7 (see Duke 2002), the enclosure would screen from public view the complex industrial appearance of the project but would significantly increase the project’s dominance and view blockage compared to either the existing power plant or

project as presently proposed. The structure would cause a high degree of visual contrast due to its massive geometric form and prominent horizontal and vertical lines. The enclosure would appear dominant in the landscape and substantially interrupt sightlines to the coastal hills and sky visible behind the project to the east. The resulting visual impact would be adverse and significant. Due to the large size of the enclosure and its close proximity to the viewers along Embarcadero Road, it is not clear that vegetative screening would be sufficiently effective in screening the structure from view such that the visual impact would be reduced to a level that would not be significant. Therefore, this option is least preferred compared to the currently proposed project or staff's structural shield concept.

#### **KOP 8 – MORRO ROCK**

As viewed from KOP 8 (see Duke 2002), the enclosure would screen from public view the complex industrial appearance of the project but would appear as a dominant horizontal form in the shoreline landscape compared to the more prominently vertical forms of the existing power plant stacks. The enclosure would cause a moderate degree of visual contrast even with removal of the existing power plant because of the prominence of the geometric form and horizontal and vertical lines. The structure would appear co-dominant to dominant and would cause a moderate degree of view blockage. Compared to the existing power plant, the full enclosure option would cause slightly less visual contrast, project dominance, and view blockage. The resulting visual impact would be adverse but not significant with removal of the existing power plant. However, compared to the proposed project or structural shields, the full enclosure option would result in greater visual contrast, project dominance, and view blockage of the coastal hills to the east. Therefore, this option is preferred over the existing power plant but least preferred compared to the currently proposed project or staff's structural shield concept.

#### **KOP 14 – SUNSET PLATEAU**

As viewed from KOP 14 (see Duke 2002), the enclosure would screen from public view the complex industrial appearance of the project but would appear as a dominant horizontal form in the shoreline landscape compared to the more prominently vertical forms of the existing power plant stacks. The enclosure would cause a moderate-to-high degree of visual contrast even with removal of the existing power plant because of the prominence of the geometric form and horizontal and vertical lines, and their contrast with the natural rounded form and irregular line of Morro Rock. The structure would appear co-dominant and would cause a moderate-to-high degree of view blockage of the harbor entrance. The enclosure would also encroach slightly on sightlines to Morro Rock. Compared to the existing power plant, the full enclosure option would cause slightly less visual contrast, project dominance, and view blockage. The resulting visual impact would be adverse but not significant with removal of the existing power plant. However, compared to the proposed project or structural shields, the full enclosure option would result in greater visual contrast, project dominance, and view blockage of the shoreline landscape. Therefore, while this option is preferred over the existing power plant, it is least preferred compared to the currently proposed project or staff's structural shield concept.

## **KOP 15 – HARBOR FRONT TRACT**

As viewed from KOP 15 (see Duke 2002), the enclosure would screen from public view the complex industrial appearance of the project but would appear as a dominant horizontal form in the shoreline landscape compared to the more prominently vertical forms of the existing power plant stacks. The enclosure would cause a moderate-to-high degree of visual contrast even with removal of the existing power plant because of the prominence of the geometric form and horizontal and vertical lines, and their contrast with the natural rounded form and irregular line of Morro Rock. The structure would appear co-dominant and would cause a moderate-to-high degree of view blockage of the coastal Pacific waters. Compared to the existing power plant, the full enclosure option would cause less visual contrast, project dominance, and view blockage. The resulting visual impact would be adverse but not significant with removal of the existing power plant. However, compared to the proposed project or structural shields, the full enclosure option would result in greater visual contrast, project dominance, and view blockage. Therefore, while this option is preferred over the existing power plant, it is least preferred compared to the currently proposed project or staff's structural shield concept.

## **CONCLUSION**

Staff concludes that from all viewing areas, the full enclosure option is more likely to cause significant visual impacts and thus, is least preferred compared to either the currently proposed project or staff's structural shield concept. Similar to the proposed project and the structural shield concept, the full enclosure option is more likely to cause visual impacts than the existing power plant when viewed from close proximity viewpoints such as KOPs 5, 6, and 7. However, unlike the proposed project or structural shields, it is not clear that the considerably larger mass of the full enclosure structure could be adequately screened by landscaping to reduce the visual impact to a level that would not be significant. From more distant viewpoints such as KOPs 8, 14, and 15, the full enclosure option would be less likely to cause significant visual impacts than the existing power plant.

## **REFERENCES**

DUKE (Duke Energy Morro Bay LLC) 2002. Morro Bay Modernization Project Visual Analysis of Full Enclosure, dated January 2, 2002. Submitted to California Energy Commission on January 2, 2002.

DUKE (Duke Energy Morro Bay LLC) 2001a. Responses to CEC Outstanding Visual Data Requests, dated June 5, 2001. Submitted to California Energy Commission on June 6, 2001.

Michael Clayton & Associates 2002. Image modifications and simulations based on images presented in Duke 2001a.